G1027

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title: Clavey River Watershed Analysis
Applicant Name: Stanislaus National Forest
Mailing Address: 19777 Greenley Road, Sonora, CA 95370
Telephone: (209) 532-3671
Fax: (209) 533-1890

Amount of funding requested: $ 174,000 for 2 years

Indicate the Topic for which you are applying (check only one box). Note that this is an important decision: see page __ of the Proposal Solicitation Package for more information.

- ☐ Fish Passage Assessment
- ☐ Fish Passage Improvements
- ☐ Floodplain and Habitat Restoration
- ☐ Gravel Restoration
- ☐ Fish Harvest
- ☐ Species Life History Studies
- ☒ Watershed Planning/Implementation
- ☐ Education
- ☐ Fish Screen Evaluations - Alternatives and Biological Priorities

Indicate the geographic area of your proposal (check only one box):

- ☐ Sacramento River Mainstem
- ☐ Sacramento Tributary:
- ☐ Delta
- ☐ East Side Delta Tributary:
- ☐ Suisun Marsh and Bay
- ☒ San Joaquin Tributary: Tuolumne River
- ☐ San Joaquin River Mainstem
- ☐ Other:
- ☐ Landscape (entire Bay-Delta watershed)
- ☐ North Bay:

Indicate the primary species which the proposal addresses (check no more than two boxes):

- ☒ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☐ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☐ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☐ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ Migratory birds

COVER SHEET (PAGE 2 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Indicate the type of applicant (check only one box):

☐	State agency	☒	Federal agency
☐	Public/Non-profit joint venture	☐	Non-profit
☐	Local government/district	☐	Private party
☐	University	☐	Other: _____

Indicate the type of project (check only one box):

☒	Planning	☐	Implementation
☐	Monitoring	☐	Education
☐	Research		

By signing below, the applicant declares the following:

(1) the truthfulness of all representations in their proposal;

(2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and

(3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

_____

(Signature of Applicant)

Executive Summary

Clavey River Watershed Analysis

US Department of Agriculture
Forest Service
Project Southwest Region

Stanislaus National Forest
19777 Greenley Rd
Sonora, CA

Project Description

We propose to conduct a Watershed Analysis (WA) for the Clavey River Watershed and a stream condition monitoring element associated with the WA.

The Clavey River is a 157 square mile tributary watershed of the Tuolumne River. The Clavey River is in the upper watershed portion of the ERPP Study Area and is located entirely within the Stanislaus National Forest.

The Clavey River is one of the most significant watersheds in the Sierra Nevada. It is one of the range's last fully free flowing major streams; it is California's first designated Wild Trout Stream; it is one of the state's premier proposed Aquatic Diversity Management Areas because its native fish assemblage is nearly intact; it has one of the highest Index of Biotic Integrity ratings in the Sierra Nevada; and it is proposed as a national Wild and Scenic River.

Although the Clavey watershed has numerous outstanding attributes it has numerous ecosystem elements whose existing condition remains less than the desired condition. It is essential to analyze the entire watershed for success in restoring its portions which are degraded.

Primary Biological/Ecological Objectives

1) To conserve the aquatic biodiversity of the Clavey River by optimizing habitat conditions for its native assemblage of fish and other aquatic species.

2) To assure that the Clavey River ecosystem is sustainable in the long term, thus addressing ecological condition and species of concern within the larger San Joaquin River watershed and the Bay-Delta.

Approach/Task/Schedule

The Clavey River watershed analysis (WA) will be conducted using the USDA Forest Service Pacific Southwest Region watershed analysis guide, "Sustaining Ecosystems, A Conceptual Framework". The tasks for this WA will follow the nine step process outline in the guide. A key task in this process is public collaboration. The product of the analysis is a set of management opportunities which will become projects for conserving/restoring ecological processes in the watershed.

We propose beginning the Clavey River WA in Winter 1998-1999 and finishing in Spring 2000.

We envision the Clavey River WA as the first phase of a larger analysis of the Tuolumne River watershed within the Stanislaus National Forest. The Tuolumne is a major part of the San Joaquin River basin and, since much of the public land portion of the Tuolumne River is in designated wilderness, it is strategically important to improve ecological condition on the remaining non-wilderness land.

Justification for Project and Funding by CALFED

This proposal addresses a high priority watershed within the upper portion of the ERPP Study Area. We believe the proposal is socially important due to demonstrated high public interest in the Clavey River watershed. CALFED funding is necessary to supplement very limited Forest Service funds.

Budget Costs and Third Party Impacts

We request $174,000 in CALFED funding for the Clavey River watershed analysis, including its monitoring element. Third party impacts will accrue as beneficial effects on the local economy of this region from the employment and monetary recirculation generated by projects developed out of this watershed analysis.

Qualifications

The Forest Service has been the land steward for 100 years on lands within the Stanislaus National Forest, and has demonstrated ability to conduct watershed analysis and to implement and monitor ecosystem restoration activities.

Monitoring

Although this is a watershed planning proposal, we also propose stream condition monitoring prior to implementing management activities resulting from the watershed analysis. Doing so will provide pre-treatment data to help determine effectiveness of the management activities.

Local Support/Compatibility with CALFED Objectives

The Clavey River watershed has significant local support. The Clavey River Wild and Scenic River Value Review, a collaborative effort of a broad spectrum of local watershed stewardship interests, was completed in December 1997. The principal recommendation from the collaborative group is to conduct a watershed analysis for the entire Clavey River watershed.

We believe this proposal is consistent with CALFED objectives in that restoration of all portions of the CALFED watersheds is necessary for the long term ecosystem health. This proposal will lead to implementation of management activities which will enhance ecological condition in a key area within the ERPP Study Area.

Clavey River Watershed Analysis

Applicant

US Department of Agriculture
Forest Service
Pacific Southwest Region
Stanislaus National Forest
19777 Greenley Road
Sonora, CA 95370

Phone: 209-532-3671
Fax: 209-533-1890
e-mail: jfrazier/r5_stanislaus@fs.fed.us

Principal Investigators

James Frazier, Forest Hydrologist, Stanislaus National Forest
Stephen Apperson, Hydrologist, Stanislaus National Forest

Clavey River Wild and Scenic River Value Review Collaborators

Clavey River Preservation Coalition, Sonora, CA
Peak Forestry Services, Soulsbyville, CA
Sierra Mac River Trips, Sonora, CA
Sierra Resource Management, Sonora, CA
Stanislaus National Forest, Sonora, CA
Tuolumne County Alliance for Resources and Environment, Sonora, CA
Tuolumne River Preservation Trust, San Francisco, CA

Project Description

Project Description and Approach

We propose to conduct a watershed analysis (WA) for the Clavey River watershed. We also propose to initiate a stream condition monitoring element associated with the WA.

The goal of the WA is to determine the condition and function of ecological processes in a watershed and recommend management practices to maintain or restore them. A WA has not yet been conducted for the Clavey watershed due to budget constraints.

The Clavey River WA will be conducted using the USDA Forest Service Pacific Southwest Region watershed analysis guide, "Sustaining Ecosystems: A Conceptual Framework"(1995). This WA Guide employs a nine step approach to produce a set of management activities which can be implemented to maintain, enhance or restore ecological processes at the landscape scale.

Our approach to staffing the WA is to use an interdisciplinary team of specialists in the resources applicable to the Clavey River watershed. These resource specialties will primarily include hydrology, fisheries, silviculture, range conservation, landscape architecture, fuels and fire management, engineering wildlife biology, and GIS. Other specialties would be used as needed. Outside agencies and groups will serve as collaborators in the WA process.

We would begin the WA in the Winter of 1999 by collecting existing information and initiating public collaboration. Summer and Fall of 1999 would be used for original data collection as needed where existing information is not available or sufficient. Winter and Spring of 2000 would be used for analysis and synthesis of the information and producing the final product of the WA. The final product of the analysis is a set of management opportunities which will become projects for conserving/restoring ecological processes.

In addition to the Clavey River WA, we propose a instituting a stream condition monitoring element. We anticipate that benefits of the management activities the WA generates will result in improvement in stream channel condition attributes. It is important to begin pre-project monitoring as soon as possible to be able to compare against post-implementation conditions. The monitoring element would begin in Summer 1999.

Evaluation Criteria Reference - evaluation criteria are directly addressed as follows:

a. Community-based - see Background, page 6
b. Environmental Results - see Expected Benefits, page 4
c. CALFED Consistency - see Project Need and ERPP Objectives, pages 6 and 7
d. Multiple Ecosystem Issues - see Expected Benefits, page 4
e. Ongoing Implementation - see Expected Benefits, page 5
f. Monitoring - see Monitoring, page 7
g. Applicant's Ability - see Applicant Qualifications, page 10

Scope of Work

The scope of work includes conducting a watershed analysis (WA) and a monitoring element in conjunction with the WA.

Within the scope of the watershed analysis and its associated monitoring element there are two work tasks: (1) Conduct a watershed analysis and (2) monitor stream condition within the Clavey watershed.

The two tasks will occur in 4 phases, as follows:

Phase 1 Conduct steps 1, 2, and 3 in the WA Guide and initiate the public collaboration process. Phase period is December 1998 - June 1999. The deliverable for this phase is a report including results of steps 1-3 and public involvement.

Phase 2 Conduct steps 4, 5 and 6 in the WA Guide. Collect field data for WA. Phase period is July 1999 - November 1999. The deliverable is a report of steps 4-6.

Begin baseline stream condition monitoring of the Clavey River. Phase period July 1999 - November 1999. The deliverable is a stream condition report.

Phase 3 Conduct steps 7, 8, and 9 in the WA Guide. Phase period is December 1999 - June 2000. The deliverable is the final WA Report.

Phase 4 Complete baseline stream monitoring of the Clavey River. Phase period is July 2000 - November 2000. The deliverable is a stream condition report.

An additional deliverable at the completion of each phase will be a Bill for Collection for reimbursement of work accomplished.

Project Location

The Clavey watershed is 100,400 acres (157 square miles) and is entirely within the Stanislaus National Forest (Figure 1). The Clavey River is 47 miles long and has numerous perennial tributaries important in sustaining its unique native assemblage of fish (Figure 2).

Expected Benefits

Primary Stressors

Although the Clavey River watershed has many attributes which make it a significant watershed in the Sierra Nevada, it has numerous ecological stressors which are believed to be preventing it from achieving desired condition:

Forest Vegetation Density/Fuel Loading - Due to century-long fire suppression policies the forest overstory and understory is much denser than the desired condition. This has adversely altered hydrograph function and creates a clear and present danger of wildfires which would disturb the

watershed well in excess of expected in a natural fire regime. This is perhaps the principal overriding stressor in that it affects several other conditions in the watershed.

Hydrograph Alteration - The century-long buildup of fuels in many parts of the Clavey watershed has reduced its summer and fall base flows as a result of an increase in plant transpiration. Restoration of these flows, especially in the Clavey River tributaries, are very important for aquatic resources to reach their desired condition.

Stream Channel Morphology Change - Meadow streams within the watershed have been altered by direct management practices such as grazing and recreation and cumulatively by other land uses such as roads, fire and timber harvest. Meadows are rare and valuable components of the watershed and are the most sensitive to disturbance. Streams have become widened, less shaded, and pool habitats have been degraded.

Riparian Vegetation Degradation - Meadows physically degraded by land uses consequently have poor vegetative condition. Outside meadows, riparian vegetation is at less than desired condition in places from past management activities such as timber harvest, roads and recreation.

Grazing Practices - Grazing in the Clavey watershed stresses sensitive areas, especially meadows and meadow streams.

Past Wildfire and Subsequent Vegetation Management Practices - The combination of fire and reforestation site preparation has degraded portions of the watershed.

Past Silvicultural Practices and Roads - Road construction and clear cutting over the past several decades has resulted in the increase in peak flows and stream sedimentation.

Primary Benefits

- Restoration of the Natural Hydrologic Regime - Flood flows can be reduced by restoring infiltration capacity in compacted areas and by reducing accelerated runoff from the road system. Base flows can be increased and seasonally sustained by thinning overstocked stands to reduce plant transpiration.

- Reduction of Risk of Large and Damaging Wildfire - At present, overstocked stands exist in the watershed and pose a severe risk that wildfire will do more damage than under a natural stand density. Such fires are a significant threat to aquatic habitat and processes from sedimentation, channel erosion and riparian vegetation consumption.

- Meadow Condition Improvement - Improvement of hydrologic function, aquatic habitat and riparian vegetative condition can be achieved by restoration and change in grazing and other land use practices.

- Reduction in Stream Sedimentation - Key sources of sediment will be identified and reduced.

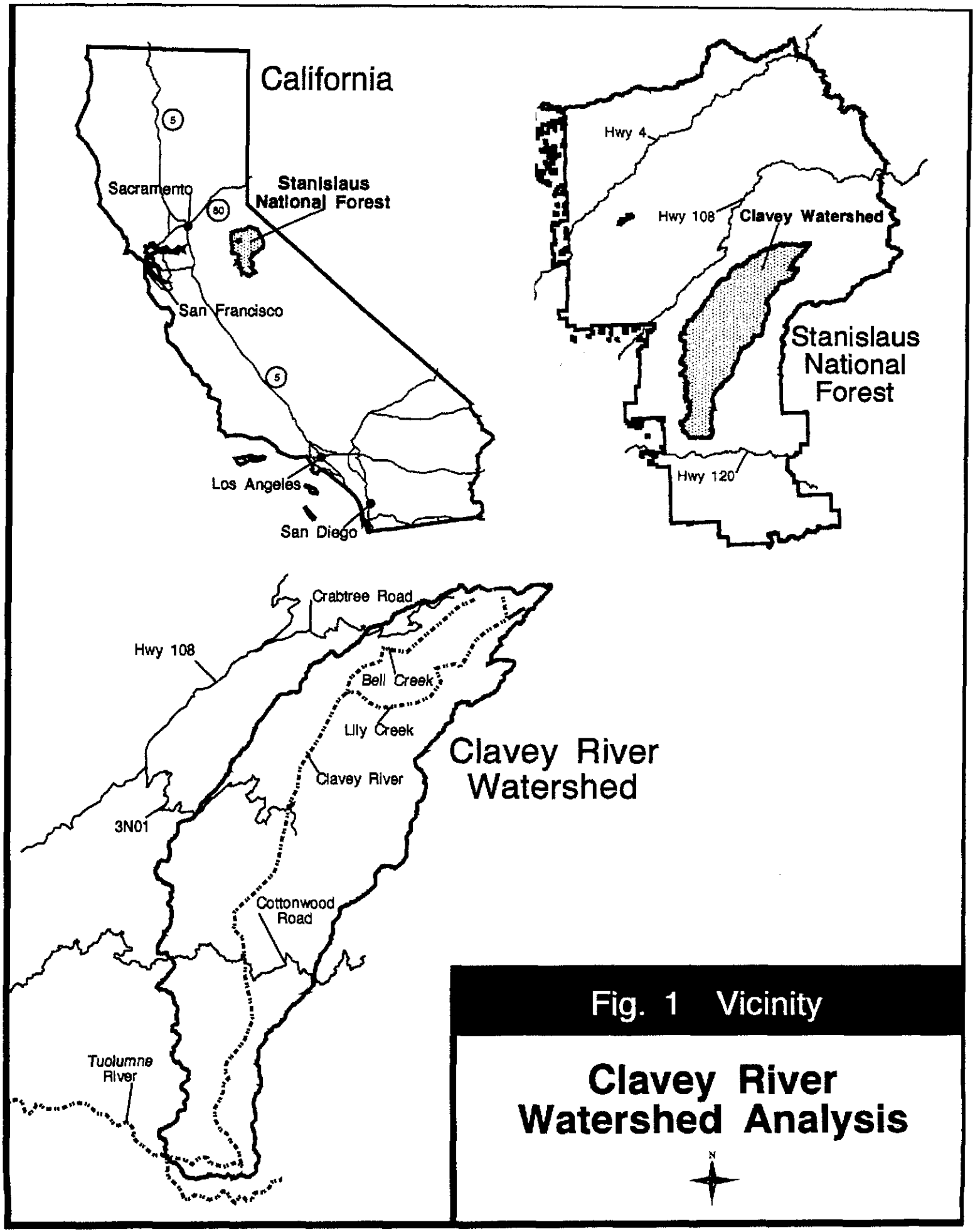
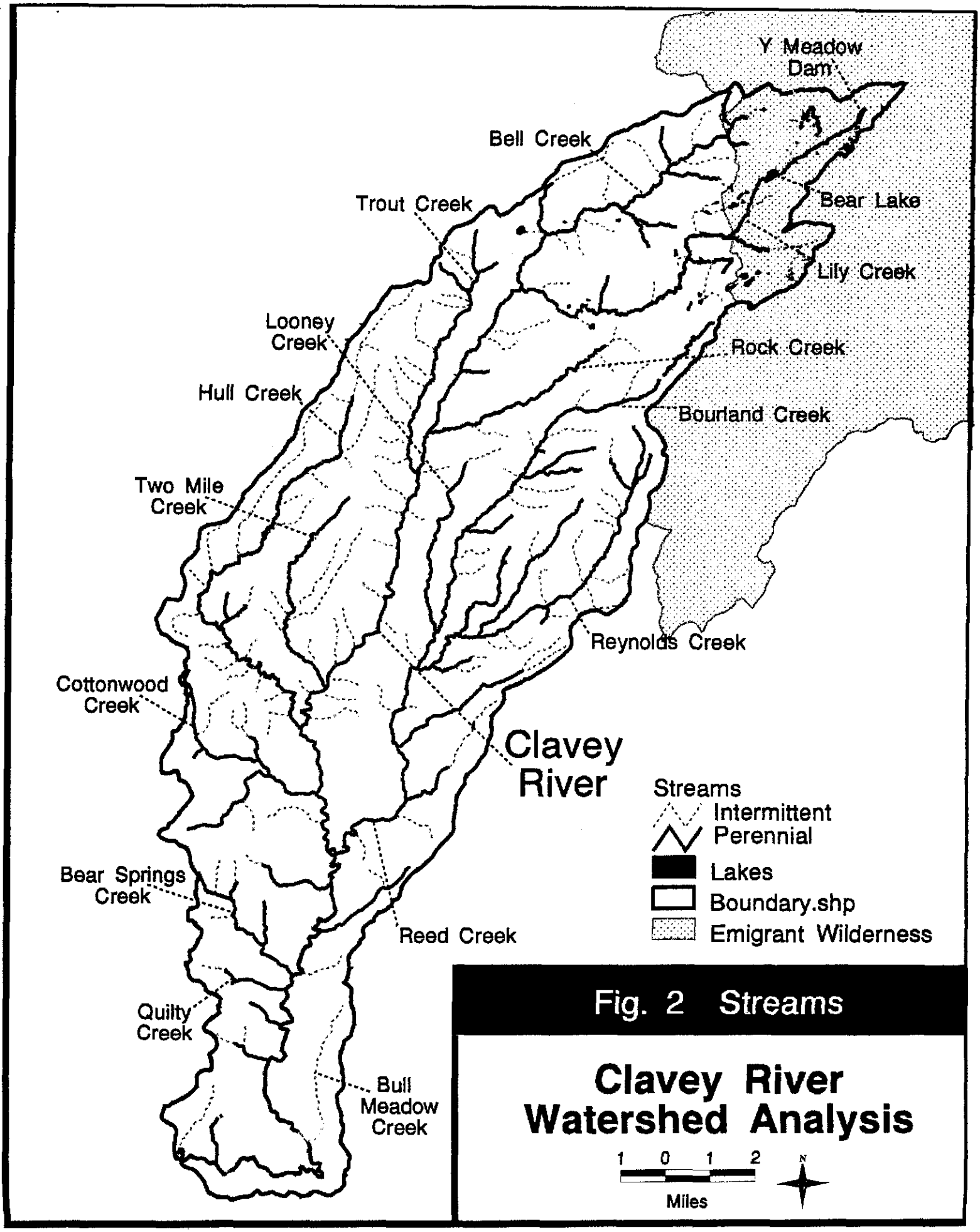


Fig. 1 Vicinity

Clavey River Watershed Analysis

I-011263


Y Meadow Dam
Bell Creek
Trout Creek
Bear Lake
Lily Creek
Looney Creek
Rock Creek
Hull Creek
Bourland Creek
Two Mile Creek
Reynolds Creek
Cottonwood Creek
Clavey River
Streams
Intermittent
Perennial
Lakes
Boundary.shp
Emigrant Wilderness
Bear Springs Creek
Reed Creek
Quilty Creek
Bull Meadow Creek
Fig. 2 Streams
Clavey River Watershed Analysis
1 0 1 2
Miles
N

- Water Quality Enhancement - Restoration of the key watershed elements above will enhance water quality within the Clavey watershed.

Secondary Benefits

- *Wildlife Habitat Improvement - Managing to reduce timber stand density increases* sunlight to the forest floor and restores habitat currently unusable by species such as deer and birds. It will also provide small mammal and rodent habitat improvement to improve predator-prey relationships.

- Recreation - Improvement of aquatic habitat and riverine aesthetics is expected to improve recreational opportunities in the watershed.

- Water Quality Enhancement - Improving water quality in the Clavey watershed can benefit habitat and species downstream in the lower Tuolumne, including the San Joaquin Fall Run Chinook Salmon.

Third Party Benefits

We expect that the WA will lead to implementation of management practices which will increase local employment and recirculation of revenue. Tree thinning, meadow and other restoration activities, and increased recreational opportunities are examples of such practices.

Ongoing Implementation Benefits

The Clavey watershed analysis is likely attract to future funding to implement ecosystem restoration. WA develops the basis for a restoration implementation schedule that is founded both in science and public interest. Watersheds with complete WA's become a focus for funding initiatives from both private and government sources. We expect the Clavey WA to lead to implementation funding via ongoing collaboration efforts as well as from state and federal ecosystem management initiatives.

Background and Ecological/Biological/Technical Justification

Background

With the exception of hydroelectric developments and gold mining, the Clavey watershed has similar land use history as other west slope Sierran watersheds. Historic land use has been sheep and cattle grazing, railroad logging, tractor logging, and the development of logging roads. The effects of these activities is present but appears to be less than other areas because the Clavey watershed is remote and has limited access.

In 1972, the state of California recognized one of the Clavey River's unique values when designated it the state's first Wild Trout Stream.

In 1986, the Turlock Irrigation District (TID) applied to the Federal Energy Regulatory Commission (FERC) to develop a major dam and hydroelectric facility the Clavey River. Engineering studies were conducted for the following several years.

I-011265

In 1991, the Stanislaus National Forest completed its Forest Land and Resource Management Plan (LRMP) which included a Wild and Scenic River Study (as required by the Wild and Scenic Rivers Act.) That study found the Clavey River eligible as a national Wild and Scenic River due to many Outstandingly Remarkable (OR) Values (OR value evaluation is required by the Act). The OR values include: The Clavey River is one of the longest remaining free flowing streams in the Sierra Nevada; The Clavey is the only "rainbow trout" river left in the Sierra Nevada with its original fish assemblage still intact; The Clavey watershed has an 8,000 acre tract of late-seral forest habitat; The Clavey watershed contains the largest Aspen forest in the Sierra Nevada south of the Eldorado National Forest; and the Clavey watershed has a combination of these and other landscape ecology features making it distinct within the Sierra Nevada. Although the Clavey River was eligible to be considered as a Wild and Scenic River the LRMP declared it unsuitable pending the outcome of TID's FERC Application.

In 1994, FERC recommended denial of the licensee to TID for the Clavey hydro project based on significant environmental impacts (FERC, 1994). TID withdrew its application in 1995.

In 1996, further scientific investigation validated the Clavey River's unique ecological attributes. The Sierra Nevada Ecosystem Project (SNEP, 1996) recognized the Clavey River watershed as one of the most significant in the Sierra Nevada (Moyle and Randall, 1996). Moyle (1996) proposed that, due to the Clavey's unique fish assemblage, it be managed as an Aquatic Diversity Management Area within California. The California Spotted Owl RDEIS (USDA,1996) identified the Clavey River as a key watershed in the Sierra Nevada.

In 1996, the Forest Service initiated a community-based collaborative review to determine future management of the Clavey River. The findings of the review were published in 1997 as The Clavey River Wild and Scenic River Value Review (summary attached). The Review included local leadership and participation by diverse interests as well as contributions from several state agencies. These interests include commodity production, river preservation, recreation and multiple-use management.

The principal recommendation of the collaborative group was to conduct a watershed analysis to provide the basis for future management which will conserve and restore the attributes that make the Clavey one of the most important watersheds in the Sierra Nevada.

Need for the Project

The importance of the Clavey watershed has been validated by scientific investigations and by the recommendations of the Clavey River Wild and Scenic Value Review collaborative group. This group of stakeholders has expressed that a watershed analysis should be conducted.

In addition, we see the Clavey River WA as the first phase of a larger analysis and management activity implementation process. We envision following the Clavey WA with others on the remainder of the Tuolumne River watershed on the Stanislaus National Forest. The Tuolumne is a major portion of the San Joaquin River basin and is a prime candidate for this type of ecosystem planning and improvement. Much of the public land in the Tuolumne River watershed is in federally designated wilderness in the Stanislaus National Forest and in Yosemite National Park. These relatively undisturbed lands serve as a keystone in ecosystem management of first conserving the lands that are most likely to show success toward achieving a goal. Combining

these wilderness lands with ecosystem planning and improvement activities on non-wilderness lands in the same watershed are a logical way to most quickly move to ecosystem conservation on a large scale in the San Joaquin River basin.

For the Bay-Delta to properly function, the entire ecosystem from source to mouth must also properly function. At present, however, the major disconnect is that the Bay-Delta, the major reservoirs and the upper watersheds are managed as three separate parts. It is essential to start to reconnect all parts in order to conserve and restore the entire ecosystem. The Clavey River watershed is an excellent place for this nexus to begin.

ERPP Objectives

This proposal meets the CALFED ERPP objectives for upper watershed processes. These processes are described in several sections within the ERPP.

Current Status of project

The Clavey watershed analysis is a new project. The intent of this funding proposal is to implement the principal recommendation in the Clavey River Wild and Scenic River Value Review. Watershed analysis is part of the Forest Service ecosystem management strategy and natural resource agenda. To this end, we want to implement the Clavey River Review's principal recommendation as soon as possible.

Monitoring and Data Evaluation

The Clavey River WA will have an associated monitoring element. Stream condition will be monitored prior to management activities being implemented as a result of the WA. The purpose of such monitoring is to capture as much of the pre-treatment condition as possible to help determine effectiveness of land and water treatments. We will select stream reaches and measure attributes of stream condition as described in the USDA Forest Service Pacific Southwest Region Stream Condition Inventory (SCI) Technical Guide (USDA, 1996). The SCI guide is a comprehensive monitoring protocol that provides consistent measures across the Sierra Nevada so that data can be compiled uniformly to measure change at the bioregional scale. Several SCI attributes can be measured by volunteers.

Implementability

The Clavey River WA is readily implementable once funding is provided. NEPA compliance is not required because it is not a decision document under federal regulations. Stream condition monitoring can be readily conducted since the watershed is national forest land.

Costs and Schedule to Implement Proposed Project

The estimated project cost breakdown is shown in Table 1. Costs are subject to change.

Table 1 - Cost Breakdown

Task	Salary	Overhead	Service Contracts	Material & Acquisition Contracts	Total Costs
Task 1 (Watershed Analysis)	$95,000	19,000			114,000
Task 1 (Stream Monitoring)	50,000	10,000			60,000
	145,000	29,000			174,000

We need CALFED funding for this project because Forest Service budget constraints essentially prevent us from embarking on this watershed analysis and associated monitoring at this time. We may be able to provide in-kind contributions but have not received our fiscal year 1999 budget, and will not know about the ensuing annual budgets until August preceding each October 1 fiscal year start.

We request full funding for this project via CALFED. However, if any partial funding is available we request that it be provided incrementally in order the project tasks are shown in Table 1.

Schedule Milestones

The project schedule is shown in Table 2. It includes project phases, tasks and associated costs. The schedule is subject to change.

Table 2 - Project schedule

Project Phase	Phase Period	Task 1 (Watershed Analysis)	Task 2 (Stream Monitoring)	Total costs
Phase 1	DEC 98 - JUN 99	$36,000		36,000
Phase 2	JUL 99 - NOV 99	36,000	30,000	66,000
Phase 3	DEC 99 - JUN 00	42,000		42,000
Phase 4	JUL 99 - NOV 00		30,000	30,000
		114,000	60,000	174,000

Third Party Impacts

We expect that the watershed analysis will lead to implementation of management practices which will increase local employment and revenues. This includes ecosystem restoration work such as fuel reduction (i.e., tree thinning, prescribed burning), meadow and stream rehabilitation and road obliteration. In addition, local recreation use revenues from camping, hiking, fishing, hunting, etc. may increase as a result of improved environmental conditions in the Clavey watershed. We anticipate no adverse third party impacts as a result of this project.

Application Qualifications

The Forest service has the capability and experience to conduct the Clavey watershed analysis. Numerous WA's have been produced over the past several years as part of the Forest service Ecosystem Management strategy. Several WA methodologies have been published by the Forest Service to guide the WA process. The Forest Service is a national leader in watershed analysis.

The Clavey River watershed analysis will be staffed with Forest Service journey level professional and technicians in the appropriate resource disciplines. An interdisciplinary team (IDT) will be assembled for this task if the proposal is successful. The organization of the IDT for the WA will include a team leader, and core and extended team members. Core resource disciplines expected to participate include hydrology, fisheries, silviculture, range conservation, landscape architecture, fire management, engineering, wildlife biology and GIS. In addition, the public collaboration element of conducting a WA includes persons from other groups or agencies who provide valuable information regarding resource issues and conditions. These include state and other federal land and species management agencies, environmental groups and industry representatives.

The monitoring element of this project for assessing stream condition within the Clavey River watershed will be staffed by Forest Service hydrologic and biologic technicians experienced in such work. They will be supervised by professional hydrologists and biologists.

Compliance with Standard Terms and Conditions

The terms and conditions described in PSP Attachment D are acceptable. Since we are an Agency as shown in PSP Table D-1 we are not required to submit forms at this time.

Literature Referenced

California Department of Fish and Game. 1985. Clavey River Wild Trout Management Plan Inland Fisheries Branch, Sacramento, CA.

Federal Energy Regulatory Commission. 1994. Clavey River Project (FERC 10081-002). Draft *Environmental Impact Statement*. FERCNES-00740. Washington, DC.

Moyle, P.B. 1996. Potential Aquatic Diversity Management Areas. In Sierra Nevada Ecosystem Project, Final Report to Congress, vol. II, Assessments and Scientific Basis for Management Options. Chapter 57:1493-1502. Centers for Water and Wildland Resources, University of California, Davis.

Moyle, P.B., and P.J. Randall. 1996. Biotic Integrity of Watersheds. In Sierra Nevada Ecosystem Project, Final Report to Congress, vol. II, Assessments and Scientific Basis for Management Options. Chapter 34:975-986. Centers for Water and Wildland Resources, University of California, Davis.

Sierra Nevada Ecosystem Project. 1996. Final Report to Congress, vol. II, Assessments and Scientific Basis for Management Options. Centers for Water and Wildland Resources, University of California, Davis.

USDA Forest Service. 1995. Sustaining Ecosystems: A Conceptual Framework. Pacific Southwest Region. San Francisco, CA.

USDA Forest Service. 1996. Managing California Spotted Owl Habitat in the Sierra Nevada Forests of California. Revised Draft Environmental Impact Statement. Pacific Southwest Region. San Francisco, CA.

USDA Forest Service. 1996. Stream Condition Inventory. Version 3.4. Pacific Southwest Region. San Francisco, CA.

USDA Forest Service. 1996. Nomination of Clavey River for Inclusion in the National Wild and Scenic River System. Pacific Southwest Region. San Francisco, CA.

USDA Forest Service. 1997. Clavey River Wild and Scenic River Review. Stanislaus National Forest. Sonora, CA.

Clavey River

Wild and Scenic River Value Review

Participants

Team Leader

Steve Apperson; Forest Service
Stanislaus National Forest; Sonora, CA

Technical Team

Clay Brandow; California Department of Forestry; Sacramento, CA

Jim Frazier; Forest Service; Stanislaus National Forest; Sonora, CA

John Keane; Forest Service; Pacific Southwest Region; Sonora, CA

Randy Kelley; California Department of Fish and Game; Fresno, CA

Gaylon Lee; State Water Resources Control Board; Sacramento, CA

Dave Lentz; California Department of Fish and Game; Sacramento, CA

John Maschi; Forest Service; Stanislaus National Forest; Sonora, CA

Catherine Phillips; Forest Service; Stanislaus National Forest; Sonora, CA

Steering Committee

Mike Albrecht; Sierra Resource Management; Sonora, CA

Will Dorrell; Peak Forestry Services; Soulsbyville, CA

Glenda Edwards; Clavey River Preservation Coalition; Sonora, CA

Charles Little; Tuolumne Watershed Visitor Center; Groveland, CA; TRPT, S. F., CA

Marty McDonnell; Sierra Mac River Trips; Sonora, CA

Nancy Rosasco; Tuolumne County Alliance for Resources and Environment; Sonora, CA

Johanna Thomas; Tuolumne River Preservation Trust; San Francisco, CA

Assistant to the Team Leader

Sharon Grant; Forest Service
Stanislaus National Forest; Sonora, CA

Overview

This report contains the findings of the Clavey River Wild and Scenic River Value Review (Clavey Review). The Clavey Review is a collaborative assessment of the affects of Stanislaus National Forest management on the 8 Outstandingly Remarkable (OR) values of the Clavey River:

1	Ecologic (a)	Bell Meadow contains the largest stand of aspen in the Sierra, south of the Eldorado National Forest and, a rich variety of habitats.
2	Ecologic (b)	The Clavey River (including Bell and Lily Creeks) has a combination of landscape ecology features making it distinct within the Sierra Nevada.
3	Fish	The Clavey may be the only "rainbow trout" river left, in the Sierra Nevada, with its original fish assemblage still intact.
4	Scenic (a)	Outstanding Variety Class A landscape at Bell Meadow provides one of the most dramatic displays of seasonal colors in the entire Sierra.
5	Scenic (b)	Outstanding Variety Class A landscape includes a deep, V-shaped, river-cut canyon and, a variety of water forms and vegetation patterns.
6	Historic/Cultural	Relatively undisturbed section of the 1853 Emigrant Route, used during the early mining period of California.
7	Wildlife	Five SOHAs and two fisher reproductive units are located on or adjacent to the river, within 8,000 acres of older mature forest habitat.
8	Recreation	Access is limited and portions are remote and wild, resulting in a rare opportunity for solitude and non-motorized recreation experiences.

The Clavey Review uses existing information to describe the status of the Clavey's Wild and Scenic River values. The review draws some relationships between the condition of the values and forest management practices. It identifies information gaps and makes suggestions on further Forest Service actions that are needed to improve our knowledge and insure protection and enhancement of the Clavey's Wild and Scenic values. The findings are intended as a resource to be used by the Stanislaus National Forest when considering management within the Clavey watershed. The review findings also serve as the foundation for further collaborative approaches to management within the watershed.

This Section contains background information on the Wild and Scenic River process and descriptions of the issues and the collaborative process. Sections 1-8 contain technical review findings and recommendations for each of the 8 OR values. The findings and recommendations contained in this report are not considered consensual advice as they are the product of individual technical assessments. While this review refers to the findings of the Sierra Nevada Ecosystem Project (SNEP) and the California Owl Revised Draft Environmental Impact Statement (CA Owl RDEIS) it recognizes neither of these sets of documents establishes new policy. "Official release" of the CA Owl RDEIS will occur after additional review by a scientific committee chartered under the Federal Advisory Committee Act (FACA).

Background

The Clavey River (Map A.1) begins at the confluence of Bell Creek and Lily Creek, approximately four miles southeast of Strawberry, California (Strawberry, CA is located on Highway 108 northeast of Sonora, CA) and drains into the Tuolumne River. The headwaters of Lily Creek consists of two forks, the western originating from Chewing Gum Lake and the eastern from Y Meadow Lake, both within the Emigrant Wilderness. The headwaters of Bell Creek originate approximately 0.5 mile southeast of Burst Rock, also within the Emigrant Wilderness. The western headwaters of Lily Creek are located approximately 1 mile due east of the headwaters of Bell Creek.

The Wild and Scenic River Study (River Study) contained in the Environmental Impact Statement (EIS) to the Stanislaus National Forest Land and Resource Management Plan (Forest Plan) documents the eligibility of the Clavey River, including the tributaries of Bell and Lily Creeks, for Wild and Scenic River designation (USDA 1991). The Record of Decision for the Forest Plan found the river unsuitable for designation. Through the Forest Service appeal process, the Forest Service Chief directed the Pacific Southwest Regional Forester to "review the suitability determination for the Clavey River in light of all new information concerning outstandingly remarkable values and potential uses of the river, and make a new recommendation." A review of information obtained since Forest Plan completion resulted in the Regional Forester's July 25, 1996 determination that the Clavey River and its two tributaries are suitable and recommended for Wild and Scenic River designation. The following factors influenced that new determination:

1. The Federal Energy Regulatory Commission (FERC) recommended no license in the Clavey Project DEIS, and the project proponent, Turlock Irrigation District, has deferred action on the proposal. Therefore, the Clavey Project, as proposed, is no longer considered a "Foreseeable Potential Development" for the purpose of determining suitability for Wild and Scenic River designation. No other current, specific proposals for water developments exist at this time.

2. The Sierra Nevada Ecosystem Project (SNEP) reinforces previously identified values and recognizes the Clavey for its high biodiversity values.

Table A.1 highlights some of the major events in the Wild and Scenic River process on the Clavey River.

Table A.1 ***The Wild and Scenic River Process***; Clavey River; Stanislaus National Forest.

Year	Description
1968	Wild and Scenic Rivers Act designates initial components and identifies initial study rivers; Clavey not included.
1979	President Carter directs Federal agencies to inventory potential Wild and Scenic Rivers and assess suitability for designation.
1982	Nationwide Rivers Inventory Phase II (AZ, CA, NV) lists potential Wild and Scenic Rivers; Clavey included. USDA/USDI issue "The National Wild and Scenic Rivers System; Final *Guidelines for Eligibility, Classification and Management of River Areas*".
1986	Turlock Irrigation District (TID) files Clavey Project preliminary application with the Federal Energy Regulatory Commission (FERC).
1990	FERC accepts Clavey Project license application. Proposed Stanislaus National Forest Land and Resource Management Plan (Forest Plan) shows Clavey eligible, but unsuitable for Wild and Scenic designation with Alternate Management protection of its Wild and Scenic River values.
1991	Regional Forester approves Forest Plan and determines Clavey eligible, but unsuitable for Wild and Scenic River designation with Alternate Management protection. Several Forest Plan appeals contest the unsuitable determination and Alternate Management protection.
1994	FERC Clavey Project DEIS recommends no license for the project as proposed.
1995	TID defers action on the Clavey Project. Appeal review decision affirms Alternate Management protection, but directs Regional Forester to make a new Wild and Scenic determination in light of new information concerning OR values and potential uses.
1996	Sierra Nevada Ecosystem Project (SNEP) reinforces previously identified values and recognizes the Clavey for its high biodiversity values. Regional Forester reviews new information and determines the Clavey suitable for Wild and Scenic River designation.

General Direction

The Wild and Scenic Rivers Act (1968 as amended); Forest Service Manual (FSM) 2354; and, Forest Service Handbook (FSH) 1909.12, Chapter 8 provide general direction for protecting Wild and Scenic River values.

The Wild and Scenic Rivers Act - Section 10 (a)

Each component of the national wild and scenic rivers system shall be administered in such a manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its esthetic, scenic, historic, archeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area

Forest Service Manual (FSM) 2354.21 - Management of Study Rivers

Manage wild and scenic river study areas to protect existing characteristics through the study period and until designated or released from consideration.

Resource management activities may be carried out provided they do not cause a negative or reduced classification recommendation.

Land management plans must identify the areas managed for the wild and scenic study river values.

Forest Service Handbook (FSH) 1909.12, Chapter 8

Management prescriptions for river corridors identified in the National River Inventory, or otherwise identified for study, should provide protection in the following ways:

To the extent the Forest Service is authorized under law to control stream impoundment's and diversions, the free flowing characteristics of the identified river cannot be modified.

Outstandingly remarkable values of the identified river area must be protected and, to the extent practicable, enhanced.

Management and development of the identified river and its corridor cannot be modified to the degree that eligibility or classification would be affected (i.e., classification cannot be changed from wild to scenic or scenic to recreational).

Current Management

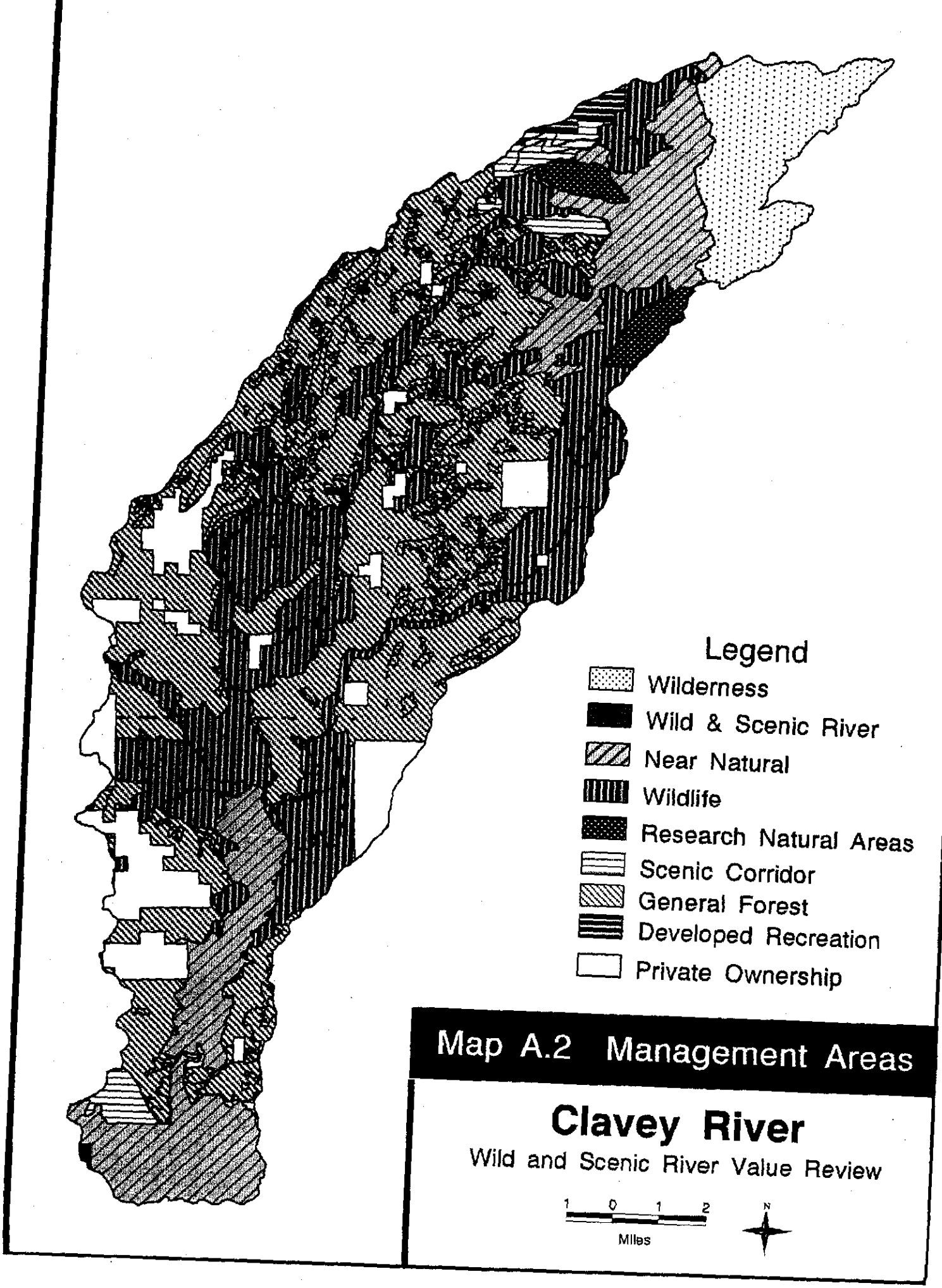
Table A.2 (Map A.2) shows management area allocations for the Clavey watershed and the potential Wild and Scenic River corridor. Table A.3 (Map A.3) shows the current Forest Plan direction for protecting Wild and Scenic River values through Alternate Management (USDA 1991).

Table A.2 ***Management Area Allocations***; Clavey River watershed and potential Wild and Scenic River corridor; Stanislaus National Forest Land and Resource Management Plan (USDA 1991); percents shown as portion of total watershed or corridor.

#	Management Area	Watershed (acres)	%	Corridor (acres)	%
1	Wilderness	6,464.73	6.44	2,070.68	13.26
2	Wild and Scenic River	53.86	0.05	1.22	0.01
3	Near Natural	14,500.32	14.45	6,099.78	39.06
4	Wildlife	25,460.54	25.37	4,253.15	27.24
6	Research Natural Area	1,483.64	1.48	616.91	3.95
8	Scenic Corridor	2,321.69	2.31	99.46	0.64
9	General Forest	41,583.68	41.43	2,224.58	14.25
10	Developed Recreation	517.74	0.52	20.17	0.13
	Private Land	7,966.38	7.93	228.12	1.46
	No Data	16.78	0.02	0.00	0.00
	Totals	100,369.36	100.00	15,614.07	100.00

Table A.3 ***Alternate Management of Wild and Scenic River Values***; Clavey River; Stanislaus National Forest (USDA 1991).

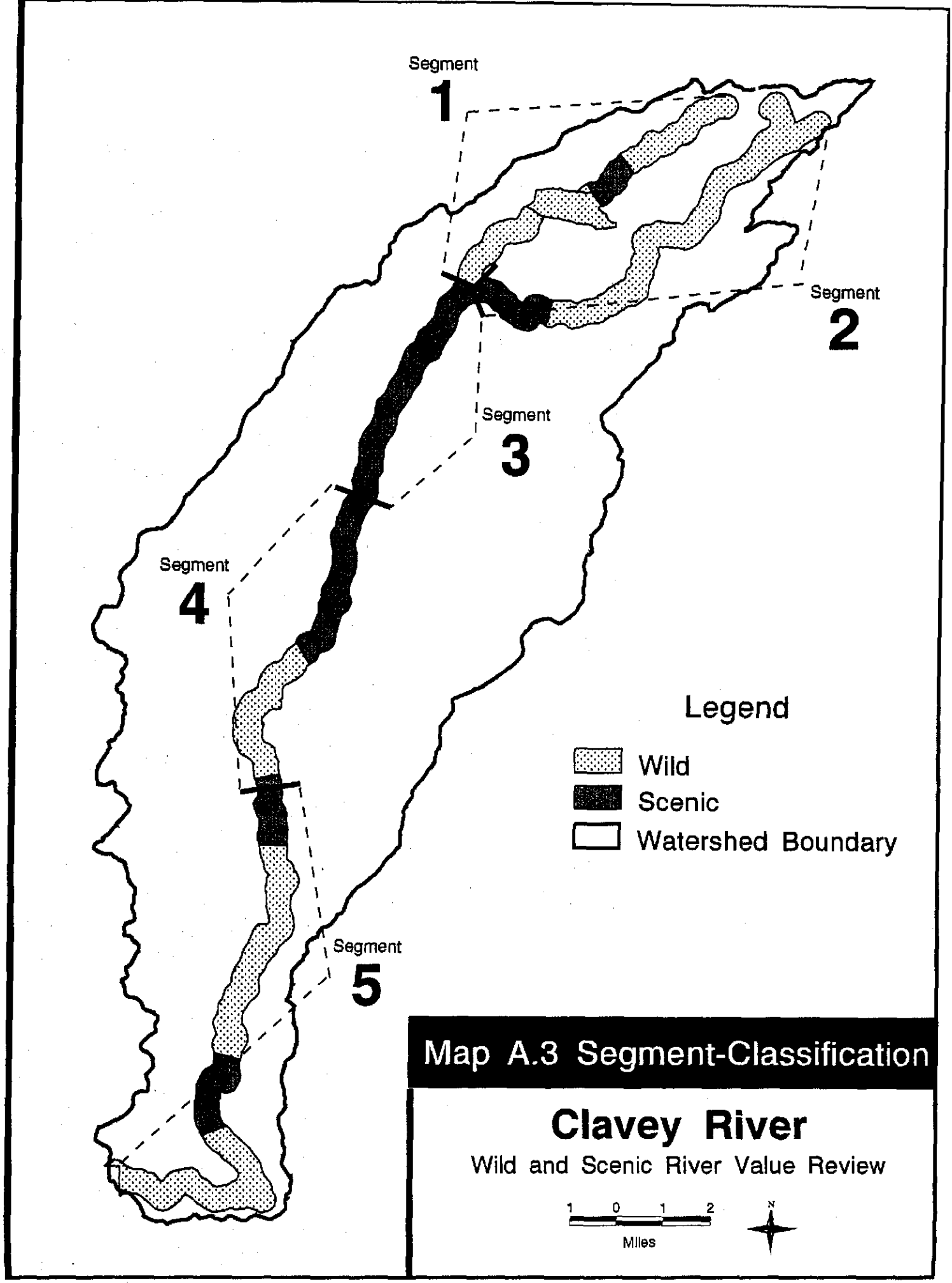
#	Segment Description	Length (*miles*)	Wild and Scenic Values	Alternate Management
1	**Bell Creek**, from its source .5 mile southeast of Burst Rock to Lily Creek and the Clavey River	7.0	Ecologic (a) Ecologic (b) Scenic (a) Historic/Cultural	**Wilderness** (1 mile) **Wildlife** (5 miles) **RNA** (1 mile)
2	**Lily Creek**, from its sources at Chewing Gum Lake and Y Meadow Lake to Bell Creek and the Clavey	11.0	Ecologic (b)	**Wilderness** (5 miles) **Wildlife** (6 miles)
3	**Clavey River**, from Bell Creek and Lily Creek to 3N01	5.0	Ecologic (b) Fish	**Wildlife**
4	**Clavey River**, from 3N01 to Cottonwood Road	8.0	Ecologic (b) Fish, Wildlife	**Wildlife**
5	**Clavey River**, from Cottonwood Road to the Tuolumne River	16.0	Ecologic (b) Fish, Wildlife Scenic (b) Recreation	**Near Natural**



Map A.2 Management Areas

Clavey River

Wild and Scenic River Value Review


Segment
1
Segment
2
Segment
3
Segment
4
Segment
5
Legend
Wild
Scenic
Watershed Boundary
Map A.3 Segment-Classification
Clavey River
Wild and Scenic River Value Review
1 0 1 2
Miles
N

I-011280

Collaboration

In April of 1996, R-5 Regional Forester, Lynn Sprague, established the Clavey collaborative review as part of a three-phase process associated with review of the Clavey River's suitability for recommendation for Wild and Scenic River designation. The suitability review (Phase 1) resulted in the Regional Forester's July 25, 1996 determination that the Clavey River is suitable and recommended for Wild and Scenic River designation. The Clavey collaborative review (Phase 2) followed the suitability review. Phase 3, Forest Plan amendments, may be deemed necessary based upon the suitability review and subsequent collaborative review.

The Regional Forester defined the collaborative review process as the following:

> *"...a collaborative endeavor looking at ongoing and proposed projects in the Clavey watershed in light of public concerns. It will begin with an early collaboration on establishing the process to be used, and a mutual understanding of expectations. We need to work together to monitor whether our Forest Plan decisions (standards and guidelines), are accomplishing the intended goals of maintaining the values of the Clavey River."*

The Tuolumne River Preservation Trust (TRPT) and the Clavey River Preservation Coalition (CRPC), two groups with long standing concerns regarding protection of the Clavey River, proposed this collaborative process to the Forest Service. Among their concerns was a belief the Outstandingly Remarkable (OR) values of the Clavey River were not being protected. They questioned whether Forest Plan direction adequately protects OR values, whether the plan is being fully implemented and whether it is being monitored and evaluated.

Prior to initiating the project, the Forest and the Regional Office more clearly established the intent of the Clavey collaborative review which was not clear in the Regional Forester's original direction. The Forest Service intended a review with a goal of maintaining the Clavey's Wild and Scenic River values, not "the values of the Clavey River". A review of all resource values in the watershed would require a watershed assessment and was beyond the scope of this effort. Letters initiating the Clavey collaborative review stated the purpose as an assessment of the cumulative effects of past, present, and planned activities in the Clavey watershed on the Wild and Scenic River values. TRPT and CRPC envisioned the collaborative process as being of broader scope and continued to express an interest in determining how past, current and proposed projects are affecting the Clavey watershed's ecological health. This difference of opinion caused difficulty and was never fully resolved. In time, participants agreed on the following Mission Statement:

> *We help the USFS determine whether or not Land Management Plan Standards and Guidelines, as implemented, are causing degradation of the Clavey River's OR (Outstandingly Remarkable) values.*

Another indication of differing expectations occurred after presentation of preliminary findings by the Technical Team and just prior to preparation of the draft report. Known for 10 months as the Clavey Watershed Review (CWR), a name change was suggested since this effort was not a watershed review, it was a Wild and Scenic value review. Participants agreed to change the name to the Clavey River Wild and Scenic Value Review. The mission remained as described above.

Process

The Regional Forester and Forest Supervisor selected a Team Leader responsible for management of the collaborative process. The Team Leader recruited technical Team members based on interest, availability, and professional resource skills. The Team Leader also invited Steering Committee members as external stake holders interested in management within the Clavey watershed. The Technical Team and Steering Committee worked together to refine the task, develop roles and responsibilities, and establish steps needed to complete the report. The Technical Team conducted assessments of existing information such as studies, reports, historic records, resource inventories, monitoring data, and scientific literature. The Steering Committee provided insight into resource issues. As a key step, both groups developed a detailed list of resource questions (Appendix A). It was the intent of the Technical Team to answer the questions as part of the assessment work. It was also the intent of collaborative participants that the Technical Team bring forward questions that could not be answered as recommendations for further action.

Synthesis

This section provides the Team Leader's overview and interpretation of the key findings of the individual OR value assessments. It is an attempt to integrate and synthesize the findings. It is not a consensus evaluation, so there may be differing viewpoints. Hopefully, it will be viewed as a meaningful and objective look at the findings.

Key Findings

Value 1
Ecologic (a)

There are concerns regarding existing resource conditions associated with this OR value. Bell Creek is incised into the surface of Bell Meadow forming a large gully with unstable banks and poor riparian conditions. The downcutting likely caused de-watering of the meadow soils. Meadow vegetation has shifted from wet meadow species to dry meadow species, and the willow component appears to be in decline. There continue to be questions regarding the health and condition of the aspen stand. These conditions have been evident for a number of years. It is uncertain what event or process started the downcutting of Bell Creek and its tributaries.

Bell Meadow is now managed as part of a Research Natural Area (RNA) with direction to protect against activities that modify the environment. Upper Bell Meadow is excluded from grazing use and lower Bell holding pasture is grazed only for two weeks in late September. Implementation of the grazing allotment permit needs to be improved. Cattle trespass into upper Bell Meadow retards natural recovery processes. It appears that Forest Plan Standards and Guidelines for Riparian Areas and Streamside Management Zones are not being met along portions of Bell Creek including the portion within the lower Bell holding pasture. Summit District personnel are aware of the trespass and have plans to correct the situation with a program of improved fence maintenance.

The assessment of existing conditions is primarily the result of monitoring and inventory information collected prior to 1991. It allows for some understanding of ecological processes and the affects of historic management but is not considered of sufficient quality to meet management objectives for the RNA. Recognizing this, the Stanislaus National Forest has requested and has been awarded a 1997 grant for monitoring within the Bell Meadow RNA. The study will fill in missing data that can be used to enhance and protect the OR values and RNA integrity. The primary recommendation is the preparation of an RNA Management Plan that includes detailed restoration, maintenance, fire suppression and

monitoring direction. A key objective is to protect or enhance the Ecologic (a) OR value by protecting and enhancing the meadow's hydrology and vegetation.

Value 2
Ecologic (b)

The status of the four attributes of the Clavey River which constitute Ecologic (b) OR value remains unchanged since 1991. The Clavey is free-flowing, relatively remote and undeveloped with the same character of life zones and elevation as in 1991. The Ecologic (b) OR value remains intact.

Forest Plan management practices are unlikely to alter this OR value. However there is uncertainty regarding "health" of vegetation which was a concern expressed during the review. No data exists to evaluate heath of vegetation types within the proposed Wild & Scenic Corridor. The greatest risk to vegetation is a stand replacing wildfire.

As Team Leader, I will take the liberty to add comment regarding the evaluation of Ecologic (b) OR value. Although the assessment finds this OR value is at low risk there was considerable interest and questions among collaborative participants regarding ecological health within the Clavey watershed. For example, there were concerns regarding timber harvest, road management, grazing affects on riparian systems, dispersed recreation and OHV use, and the status of amphibians and wildlife. These questions could not be answered within the context of Ecologic (b) OR value, and many were beyond the scope of this Wild and Scenic Value Review. For the above reasons, the Ecologic (b) assessment contains a recommendation to perform a watershed analysis for the Clavey watershed. A watershed analysis recommendation is also found in the Value 3, Fish assessment and the Value 7, Wildlife assessment. See the Value 7 assessment for a description of spatially explicit landscape scale planning.

Value 3
Fish

The Fish OR value remains a unique attribute of the Clavey River and the historic native fish assemblage remains largely intact and abundant. However, existing information on fish population and status is limited. Understanding of trophic ecology of the Clavey River and its tributaries is general at best.. The assessment identifies the important connection between the health of tributary streams and the Fish OR value. It also identifies management practices and natural events that pose risk to the Fish OR value. An emphasis is placed on protecting tributary streams and conducting watershed analysis to improve knowledge of watershed conditions and processes, affects of forest management activities, and status and trends for aquatic resources. Tributary streams and streamside zones should be managed to protect aquatic/riparian resources in order to protect the downstream Fish OR value in the Clavey River. Impacts to tributary streams are transmitted downstream through physical and biological processes.

Among the management practices that pose risk is grazing within riparian areas. Specifically, conditions at Bell Meadow are of concern. Riparian and stream bank conditions are poor [see Ecologic (a)]. Bell Meadow appears to be a significant source of sediment to lower stretches of Bell Creek and the Clavey River. Stand replacing wildfire and large flood events are a risk to the Fish OR value.

A watershed analysis is recommended. In addition, a number of approaches are proposed for the protection of aquatic biodiversity. One approach is to consider the Clavey watershed as an "Aquatic Diversity Management Area" (Moyle, 1996). Another would establish the Clavey River as an "emphasis watershed" as outlined by the CA OWL.RDEIS (USDA 1996).

Value 4
Scenic (a)

The key finding for Scenic (a) OR value, at Bell Meadow, is its close relationship to the Ecologic (a) OR value. The aspen and rich variety of meadow habitats that provide the Ecologic (a) OR value are the same attributes that provide the scenic quality associated with Scenic (a) OR value. The ecologic conditions and processes provide the scenery. One can assume the Scenic (a) OR value is protected as long as the Ecologic (a) OR value is protected. For that reason the Scenic (a) and Ecologic (a) assessments include the same recommendations for increased monitoring, restoration and improved management.

Value 5
Scenic (b)

Forest Plan management direction is sufficient to protect or enhance the Scenic (b) OR value. It is unlikely that any of the management activities prescribed by the Forest Plan under Near Natural Management would alter the Variety Class A landscape, deep, V-shaped canyon, or the variety of water forms.

Value 6
Historic/Cultural

Forest Plan management direction is sufficient to ensure continued preservation of the Historic/Cultural OR value. The Emigrant Trail follows the approximate pathway used by the 1853 emigrants, and no visible remnants exist to preserve. The historic value is primarily one of interpretation and setting.

Value 7
Wildlife

The Wildlife OR value assessment relies on the 1991 Stanislaus National Forest GIS vegetation layer to provide insights regarding current amounts and spatial distribution of late-seral vegetation in the Clavey watershed. It was difficult to draw accurate conclusions because of errors in classification rates for the larger tree size classes in the GIS database. Although uncertainty exists, this preliminary assessment indicates that late-seral/mature conifer vegetation appears to be relatively abundant and distributed in relatively large continuous patches, thus providing opportunities for management alternatives that incorporate the best available scientific information. Late-seral conditions appear to have changed little since the database was developed because no extensive management activity has occurred.

There are a number of significant recommendations of actions that are needed to manage late-seral/old growth forests and insure continued protection of the Wildlife OR value. The assessment describes the many limitations of the existing vegetation database and recommends the development of an accurate map designating the amounts and spatial configuration of existing vegetation types and structural classes at the watershed scale. A reliable map is a necessary first step in a key recommendation to move toward a management approach that utilizes recent developments in ecosystem management and landscape ecology. This approach emphasizes the fundamental importance of large-scale dynamics in both space and time in the management of natural resources. A full assessment of the status of wildlife associated with late-seral forest areas in the Clavey River watershed is beyond the scope of this report. Review of data for wildlife species related to vegetative conditions should be an important component of future landscape or watershed analysis.

The assessment contains a number of additional recommendations regarding inventory and monitoring of wildlife. Special recognition is given to the uncertain status of amphibians and the need to increase survey efforts to document abundance and distribution. As a final recommendation the Forest should

reconsider the manner in which the Wildlife OR value is described. The current definition is unclear and should be modified to reflect a more accurate and ecologically justifiable spatial delineation.

> ***Note***: A review of Wild and Scenic River Study planning notes shows the original intent of the Wildlife OR value was not clearly communicated. A new description needs to include the value the Clavey River as an important connecting corridor providing continuous linkage for migration and reproductive habitat needs for important wildlife species.

Value 8
Recreation

Forest Plan management direction is sufficient to protect or enhance the Recreation OR value. It is unlikely that any of the management activities prescribed by Near Natural Management would alter the remote and wild recreation characteristics of Segment 5

Steering Committee Recommendations

The Clavey Review Steering Committee has reviewed the Technical Team findings and recommendations contained in this report and has identified the following priorities for the Forest Service to consider.

1. Conduct a Clavey watershed analysis. Use the Clavey Review findings and recommendations to help identify key issues and information needs.

2. A Bell Meadow RNA management plan should be completed and implemented.

3. Address issues and concerns raised in this review in all planning documents for projects in the Clavey watershed.

4. Consider amending Forest Plan Chapter V to include specific key indicators for outstandingly remarkable values.

5. Continue to use a collaborative approach to management within the Clavey watershed.

For immediate action:

- Improve and repair fencing around Bell Meadow to prevent cattle trespass. Support and encourage District and Forest range personnel in order to facilitate proficient range management and permit administration.

- With cooperation of permittees, exclude grazing use from lower Bell holding pasture until an alternative water source can be developed and the riparian corridor in this pasture fenced from grazing. An alternative strategy would be development of a new holding pasture nearby that provides for better protection of aquatic/riparian values.

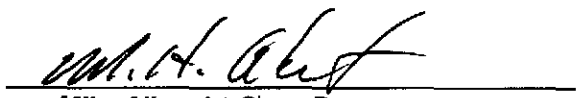
- Resample Clavey fishery index stations in 1997 to observe population effects of the January, 1997 flooding.

- Survey Bell Creek in 1997 to identify extent, distribution, and relative abundance of brook trout.

- Re-install the Clavey River streamflow gauge at the 1N01 bridge.

- Enter information (e.g., timber harvest, prescribed fire, brush control, etc.) into the GIS vegetation layer database in a timely manner.

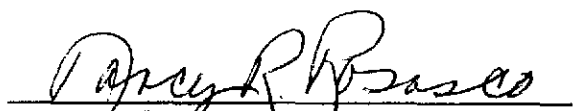
Clavey Review Steering Committee



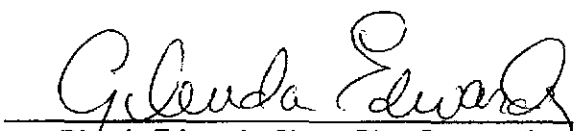
Mike Albrecht, Sierra Resource Management; Sonora, CA

Marty McDonnell, Sierra Mac River Trips; Sonora, CA

Will Dorrell, Peak Forestry Services; Soulsbyville, CA

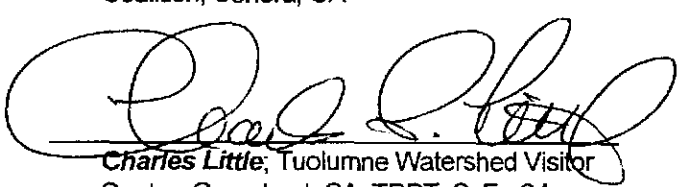


Nancy Rosasco, Tuolumne County Alliance for Resources and Environment; Sonora, CA



Glenda Edwards, Clavey River Preservation Coalition; Sonora, CA

Johanna Thomas, Tuolumne River Preservation Trust; San Francisco, CA



Charles Little, Tuolumne Watershed Visitor Center; Groveland, CA; TRPT, S. F., CA